and 600,000 to 1,000,000 feet of logs were carried out of the river.

Numerous plantations are already saturated with water from the threatening river.

At Shreveport, Louisiana, 17th, the Red river rose rapidly, caused by the swollen condition of its tributaries. Much damage was done to the cotton crop, and many farmers along the river have plowed up the cotton and are planting corn and millet.

Reports from Bolivar county, Mississippi, dated May 22d, state that 7,000 acres of land are under water in that county.

At Palestine, Texas, on the seventh, heavy rains caused washouts on the railroad; two bridges and trestle-work near Buffalo creek were destroyed.

At Saint Vincent, Minnesota, 4th, the lower part of the town was about twenty inches under water. On the eleventh the water receded but on the fifteenth again rose, and reached the habitations, causing several families to vacate their dwellings. The average depth of water throughout the town was from three to four feet, except in the extreme northern part, which was not overflowed. The rise being gradual, the people were enabled to secure their property and the damage was consequently slight. The overflowed region extended from Breckenridge, Minnesota, to Morris, Manitoba, about twenty-five miles north. No damage occurred to crops in the vicinity of Saint Vincent, as the average width of the flood on either side of the river, contiguous to the town, did not exceed one mile.

Keokuk, Iowa, during the sixth and seventh, the Skunk and Des Moines rivers rose rapidly, washing out railroad tracks and causing considerable damage.

HIGH TIDES.

New London, Connecticut, 12th, 26th.

Little Egg Harbor, New Jersey, 11th, 12th.

Fort Macon, North Carolina, 15th.

Hatteras, North Carolina, 14th, very high tide; overflowing the greater portion of the island.

Portsmouth, North Carolina, 14th.

Cape Lookout, North Carolina, 13th, cape nearly covered.

New River, North Carolina, 13th, highest tide since 1876.

Indianola, Texas, 9th.

Flushing, New York, very high tides on 10th, 11th, 12th.

Delaware Breakwater, 13th.

New York, 11th, 12th, highest tides ever known, causing great damage at various watering places along the coasts of Long Island and New Jersey.

TEMPERATURE OF WATER.

The temperature of water, as observed in rivers and harbors at Signal Service Stations, with the average depth at which observations were taken, is given in the table on the right-hand of chart ii. In the first column of the table is given the maximum temperature observed during the month; and in the second column the minimum temperature observed during the same period.

The following table gives the highest and lowest temperature of water at the several stations, with the range of water temperature, mean temperature of the air at the station, and the depth of water at which the observations were taken. It will be seen that the greatest ranges of water temperature occurred at the following stations: Chincoteague, 21°; Galveston, 19°; New Haven, 16°; Alpena and Toledo, 15°.

Temperature of Water for May, 1882.

STATION.	Temperature at bottom.		Range.	Average depth in feet and inches.	Mean temperature of the air at station.
	Max.	Min.			
	°	°	°	ft. in.	°
Atlantic City	59.3	51.2	8.1	5 7	73.2
Alpena	55.	40.	15.0	42 0	44.4
Augusta	79.9	68.	11.3	6 10	69.7
Baltimore	67.	55.	12.0	9 11	[illegible]

Temperature of Water for May, 1882—Continued.

STATION.	Temperature at bottom.		Range.	Average depth in feet and inches.	Mean temperature of the air at station.
	Max.	Min.			
	°	°	°	ft. in.	°
Boston	54.5	45.2	9.3	25 0	49.8
Buffalo	57.	46.	11.0	9 11	49.3
Burlington					
Cedar Keys	84.	70.	14.0	9 2	75.2
Charleston	77.4	67.4	10.0	41 9	71.7
Chincoteague	70.	49.	21.0	6 0	56.2
Cleveland	59.1	48.6	10.5	14 0	51.0
Detroit	57.	45.	12.0	24 3	53.2
Duluth	45.	36.	9.0	14 11	46.1
Delaware Breakwater	63.5	51.	12.5	8 7	55.0
Eastport	39.7	35.8	3.9	15 8	43.5
Escanaba	52.	40.	12.0	15 0	46.6
Galveston	83.	64.	19.0	14 8	75.2
Grand Haven	58.5	46.5	12.0	19 0	51.9
Indianola	82.4	71.7	10.7	9 8	75.8
Jacksonville	81.	73.	8.0	18 0	74.6
Key West	87.2	77.8	9.4	17 1	80.0
Marquette	46.0	38.0	8.0	10 8	46.0
Milwaukee	51.5	42.6	8.9	8 0	48.7
Mobile	75.5	69.0	6.5	16 0	72.6
New Haven	63.2	47.2	16.0	14 9	51.3
New London	54.	46.	8.0	13 2	51.5
Newport	55.1	43.9	11.2	10 9	49.8
New York	59.	48.5	10.5	22 7	53.5
New Shoreham	53.8	44.8	9.0	9 4	48.9
Norfolk	70.	60.	10.0	16 11	63.0
Pensacola	77.7	72.	5.7	17 9	72.8
Portland, Me	48.5	40.5	8.0	19 1	51.5
Portland, Oreg	58.8	50.	8.8	76 4	56.3
Port Eads	70.5	67.	3.5	9 9	74.1
Provincetown	53.5	44.	9.5	14 0	48.0
Punta Rassa	87.	76.6	10.4	11 8	76.7
Sandusky	60.7	48.5	11.2	10 0	52.8
Sandy Hook	56.6	47.9	8.7	2 3	54.3
San Francisco	58.6	53.6	5.0	29 4	56.2
Savannah	78.8	69.9	8.9	18 3	72.8
Smithville	75.	67.	8.0	10 0	68.0
Thatcher's Island	50.6	40.5	10.1	7 0	47.8
Toledo	65.	50.	15.0	12 1	53.4
Wilmington	74.5	67.	6.5	18 0	68.5

ATMOSPHERIC ELECTRICITY.

AURORAS.

No remarkable auroral displays were observed during the month. The most important display occurred on the seventeenth, and was reported by stations in New England, Alpena, Michigan, and Bismarck, Dakota, as follows: Portland, Maine: A faint auroral light visible from 9 to 11 p. m. Gardiner, Maine: Faint aurora visible from 10 p. m. to 12.30 a. m. of the eighteenth; Mount Washington: Faint aurora visible from 10.15 p. m. until 12.20 a. m. of the eighteenth, extending from northwest to northeast, and to an altitude of 15°; Burlington, Vermont: From 11 to 11.40 p. m., aurora consisting of a dark segment with a few well-defined streamers; Alpena, Michigan: From 8.40 to 11.40 p. m., aurora consisting of a diffuse light in the northern sky, with a few faint streamers shooting towards the zenith; Bismarck, Dakota: Auroral light visible from 9 to 11 p. m.; beams reaching altitude of 15° were observed from 9.30 to 10 p. m. Other displays have been reported as follows:

Antrim, New Hampshire, 5th,: Aurora observed during the evening.

New Corydon, Indiana, 9th,: Faint aurora observed from ten p. m. until midnight.

Pensacola, Florida, 9th, from 8 to 9.15 p. m.: An aurora of whitish color, sufficiently bright to attract the attention of all persons on the streets, was observed between the north and northwest. The presence of clouds prevented its extent from being more fully determined.

Bangor, Maine, 10th,: Aurora with streamers at 9 p. m.; was more brilliant at 11 p. m.

Newport, Vermont, 10th,: Aurora during the evening.

Vevay, Indiana, 10th · Faint aurora, visible from 10 to 11.30 p. m.

Eastport, Maine, 11th, from 11 to 11.40 p. m.: Aurora of bright straw color, appearing in bright flashes and fading away at intervals. In the northwest, streaks of a deep crimson color were observed.

Gardiner, Maine, 11th, 8 p. m.: Bright aurora; obscured by clouds at 10.30 p. m.

Burlington, Vermont, 11th,: Aurora seen through the openings in the clouds from 9 to 11.40 p. m. Streamers were observed in the northwestern sky at 11.15 p. m.

Mobile, Alabama, 11th: Faint aurora visible from 8 to 9 p. m. No waves or streamers were observed. It rose to an altitude of about 20° and converged toward the zenith. A short while before 9 p. m. it began to recede and soon disappeared.

Alpena, Michigan, 13th, from 9 p. m. to 2 a. m. of 14th,: Aurora consisting of a diffuse light.

Manitowoc, Wisconsin, 13th: Aurora visible during the evening.

Alpena, Michigan, 14th, 9.30 p. m.: Aurora, consisting of a diffuse light with a few streamers.

Manitowoc, Wisconsin, 14th: Aurora observed during the evening.

Marquette, Michigan, 14th, from 10.35 to 11.30 p. m.: Aurora, with beams reaching an altitude of 45°, illuminating the whole northern sky.

Burlington, Vermont, 19th, from 10 to 11.45 p. m.: Aurora consisting of a dark olive-green light; no prominent features.

Bismark, Dakota, 19th, from 8 to 11 p. m.: Faint auroral light.

Lansing, Michigan, 20th,: Aurora during evening.

Hastings, Michigan, 21st,: Aurora during evening.

Marquette, Michigan, 21st, 9.45 to 11.10 p. m.: Auroral light extending across the northern heavens.

Escanaba, Michigan, 21st, from 8 to 10.15 p. m.: Diffuse auroral light with a few streamers pointing toward the zenith.

New Corydon, Indiana, 23d, 2 a. m.: Aurora with white segment; altitude 10°, azimuth 65°.

Gardiner, Maine, 25th, at midnight: A flattened auroral arch with dark cloud beneath appeared; at 3.20 a. m., the arch was brighter and extended farther eastward.

New Haven Connecticut, 26th: Dim auroral light discernible in the northern sky at 1 a. m.

Cambridge, Massachusetts, 26th: Auroral light observed at 10:15 p. m.

Gardiner, Maine, 26th: Faint auroral light from 11 p. m. to 12.30 a. m. of the 27th.

THUNDER-STORMS.

Thunder-storms were reported in the various districts on the following dates:

New England, 7th, 14th, 16th, 24th, 28th, 29th, 30th.

Middle Atlantic states, 1st, 5th, 6th, 9th, 10th, 11th, 13th, 14th, 17th, 20th, 21st, 22d, 23d, 24th, 26th, 27th, 28th, 29th, 31st.

South Atlantic states, 4th to 7th, 9th to 12th, 14th to 17th, 25th, 26th, 28th, 29th, 31st.

Florida peninsular, 1st, 2d, 6th, 7th, 8th, 10th, 11th, 15th, 24th, 26th, 27th, 29th.

East Gulf states, 6th to 11th, 13th, 20th, 21st, 27th, 28th, 29th, 31st.

West Gulf states, 2d to 10th, 13th, 20th, 25th, 26th, 27th, 30th, 31st.

Ohio valley and Tennessee, 4th, 13th, 15th, 16th, 25th to 28th, 31st.

Lower lake region, 1st, 4th, 8th, 9th, 10th, 24th, 27th, 28th, 31st.

Upper lake region, 3d, 4th, 6th to 10th, 13th, 18th, 24th, 25th, 27th, 30th.

Upper Mississippi valley, 3d, 4th, 5th, 7th, 8th, 9th, 10th, 19th, 20th, 24th to 28th, 30th, 31st.

Missouri valley, 3d, 4th, 5th, 8th, 16th, 18th, 19th, 23d, 24th, 26th, 29th, 30th, 31st.

Extreme northwest, 4th, 16th, 18th, 31st.

Northern slope, 2d, 3d, 5th, 7th, 15th, 16th, 19th, 26th to 30th.

Middle slope, 1st, 2d, 5th, 6th, 15th to 19th, 24th, 25th, 26th, 29th.

Southern slope, 1st to 6th, 8th, 9th, 16th, 17th, 18th, 21st, 23d to 26th, 28th, 29th, 30th.

Rio Grande valley, 3d, 5th, 6th, 12th, 16th, 17th, 18th, 20th, 24th, 28th, 31st.

Northern plateau, 1st, 2d, 3d, 6th, 10th, 11th, 12th, 16th, 18th, 27th.

Middle plateau, 23d, 24th, 25th, 28th.

Southern plateau, 6th, 7th, 8th, 13th, 17th, 22d, 29th, 30th.

Thunder-storms were also reported from the following stations not included in the districts named above: Portland, Oregon, 2d; Red Bluff, California, 2d; Visalia, California, 2d.

During thunder-storms the following instances of damage by lightning have occurred:

Clay Centre, Kansas, 26th: At Wakefield, sixteen miles southeast of this place, a store was struck, cutting the chimney in halves and melting a number of cans containing fruit.

Little Rock, Arkansas, 4th: A house at this place was struck; the lightning knocked down the chimney and tore off a part of the roof about ten feet square. It passed down a metallic spout and through a barrel full of water, knocked out the bottom of the barrel and entered the ground, making a hole about two feet in diameter and two feet deep. On the ninth, a tree in the state house yard was struck; at the same time a man was made insensible on the street about two hundred yards distant.

Bismarck, Dakota, 31st: Lightning struck and tore out the end of a dwelling. A man, the only occupant of the house, was thrown violently down. Silverware in the house was melted.

Huron, Dakota, 4th: Lightning struck a wind vane, passing from it to the anemometer, and from thence along the wires to the self-register, burning that instrument together with telegraph instruments, switch, and ignited the window curtain. Four distinct explosions occurred within the office, and were heard nearly a square distant. The observer felt a severe shock, which rendered him insensible for several minutes.

At Shelbyville, Kentucky, during a thunder-storm on the night of the 4th, the lightning struck several points in the town. Trees, fences, and houses were more or less damaged; the inmates of one of the houses, had a very narrow escape, being made insensible by the fluid. Several valuable cattle were killed.

TELEGRAPHIC COMMUNICATION INTERRUPTED BY ATMOSPHERIC ELECTRICITY.

Fort McKavett, Texas, 20th, 30th.

Fort Elliott, Texas, 1st, 2d, 6th, 29th.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various districts on the following dates:

New England, 3d, 5th, 6th, 7th, 8th, 9th, 10th, 21st, 22d, 25th, 28th, 30th, 31st.

Middle Atlantic states, 8th, 9th, 22d, 24th, 26th, 28th.

South Atlantic states, 8th, 11th, 19th, 20th, 24th, 31st.

Florida peninsula, 2d, 23d, 29th, 30th.

West Gulf states, 17th, 23d.

Ohio valley and Tennessee, 3d, 4th, 7th, 8th, 9th, 14th, 15th, 19th, 21st, 24th, 26th, 30th.

Lower lake region, 3d, 5th, 6th, 8th, 16th, 17th, 19th, 24th, 26th, 30th.

Upper lake region, 2d, 5th, 6th, 7th, 8th, 14th, 19th, 21st, 24th to 29th.

Upper Mississippi valley, 3d, 6th, 9th, 14th, 18th, 19th, 24th, 26th, 27th, 29th 30th.

Missouri valley, 20th, 25th. 28th, 30th.

Northern slope, 24th, 25th, 31st.

Middle slope, 7th, 9th, 10th, 16th, 21st, 28th.

Northern plateau, 5th, 11th, 21st, 22d, 24th, 30th, 31st.

North Pacific coast region, 21st, 28th, 31st.